

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	3724953	layer\$3 or strata or lamina or lamella\$2 or lamina\$3 or laminose or stratif\$4	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:22
L2	51014	anode with L1	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:22
L3	1	("20040048160").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2005/06/14 14:23
L4	8934	anode same (thin adj film)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:24
L5	5347	anode with (thin adj film)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:23
L6	8408	lithium near3 alloy	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:23
L7	3724953	layer\$3 or strata or lamina or lamella\$2 or lamina\$3 or laminose or stratif\$4	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:23
L8	4585	(layer\$3 or strata or lamina or lamella\$2 or lamina\$3 or laminose or stratif\$4 ) same (anode same (thin adj film))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:23
L9	640304	battery or batteries or ((electrolyte or electrochemical) adj cell) or (energy adj storage adj (device or unit)) or (energy adj device)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:23
L10	10269	(anode or (negative adj electrode)) same (thin adj film)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:23

L11	5271	(layer\$3 or strata or lamina or lamella\$2 or lamina\$3 or laminose or stratif\$4 ) same ((anode or (negative adj electrode)) same (thin adj film))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:23
L12	562	((layer\$3 or strata or lamina or lamella\$2 or lamina\$3 or laminose or stratif\$4 ) same ((anode or (negative adj electrode)) same (thin adj film))) and (lithium near3 alloy)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:23
L13	256	((layer\$3 or strata or lamina or lamella\$2 or lamina\$3 or laminose or stratif\$4 ) same ((anode or (negative adj electrode)) same (thin adj film))) and (lithium near3 alloy)) and (battery or batteries or ((electrolyte or electrochemical) adj cell) or (energy adj storage adj (device or unit)) or (energy adj device))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:23
L14	1127	(429/231.95).ccls.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:23
L15	15030858	(mg or magnesium) or (boron or B) or (Al or aluminum) or (ga or gallium) or in or indium or si or silicon or ge or germanium or sn or tin or pb or lead or sb or antimony or bi or bismuth or cd or cadmium or ag or silver or zn or zinc or hf or hafnium or zr or zirconium or y or yttrium	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:23
L16	6698	((mg or magnesium) or (boron or B) or (Al or aluminum) or (ga or gallium) or in or indium or si or silicon or ge or germanium or sn or tin or pb or lead or sb or antimony or bi or bismuth or cd or cadmium or ag or silver or zn or zinc or hf or hafnium or zr or zirconium or y or yttrium) same ((anode or (negative adj electrode)) same (thin adj film))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:23
L17	283367	sony.as.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:23

L18	4620	(429/122,218.1,231.6,219,22,225,226).ccls.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:23
L19	20793	thin adj film adj layer\$2	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:23
L20	892	(battery or batteries or ((electrolyte or electrochemical) adj cell) or (energy adj storage adj (device or unit)) or (energy adj device)) and (thin adj film adj layer\$2)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:23
L21	145	((olefin or olefinic) or ((S or sulfur) adj resin) or ((n or nitrogen) adj resin) or ((F or fluorine) adj resin)) same ((electrode or anode) adj (support or plate or collector or substrate))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:23
L22	1	("6183901").PN.	USPAT; USOCR	OR	OFF	2005/06/14 14:23
L23	2	((("4717634") or ("5160712"))).PN.	USPAT; USOCR	OR	OFF	2005/06/14 14:23
L24	50	("5641591" "4844996" "6051340" "5677081" "5705293" "4626335" "4794060" "4996129" "5484461" "4292378" "4994333" "5587256" "5624606" "6294289" "6350545" "6168884" "5290592" "6228536" "6203947" "6432576" "6713987" "6805999" "5658687" "4579795" "5658689" "5888666" "6248479" "6063142" "4496640" "4795687" "5304436" "5434015" "5482790" "5498490" "5830603" "5843592" "5871865" "6103426" "6346343" "6413672" "6413677" "6420071" "6468690" "6485862" "6733923" "6780207" "5587257" "6007945" "4888258" "5478671").pn.	USPAT	OR	ON	2005/06/14 14:23
L25	52	((429/231.95).ccls.) and ((second or third or fourth) adj metal)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:23
L26	4	("5039582"   "5162178"   "5411820"   "5449575").PN.	USPAT	OR	ON	2005/06/14 14:53

L27	19	((("5641591" "4844996" "6051340" "5677081" "5705293" "4626335" "4794060" "4996129" "5484461" "4292378" "4994333" "5587256" "5624606" "6294289" "6350545" "6168884" "5290592" "6228536" "6203947" "6432576" "6713987" "6805999" "5658687" "4579795" "5658689" "5888666" "6248479" "6063142" "4496640" "4795687" "5304436" "5434015" "5482790" "5498490" "5830603" "5843592" "5871865" "6103426" "6346343" "6413672" "6413677" "6420071" "6468690" "6485862" "6733923" "6780207" "5587257" "6007945" "4888258" "5478671").pn. ) and (anode same (thin adj film))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:23
L28	35	((429/122,218.1,231.6,219,22,225,226).cccls.) and sony.as.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:23
L29	16	((429/122,218.1,231.6,219,22,225,226).cccls.) and (((anode or (negative adj electrode)) same (thin adj film)) same (lithium near3 alloy))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:23
L30	13	((("5294428") or ("5714281") or ("6146790") or ("6686094") or ("4959281") or ("5437945") or ("5561005") or ("5451477") or ("5643426") or ("6623888") or ("5639575") or ("5716732") or ("6623892"))).PN.	USPAT; USOCR	OR	OFF	2005/06/14 14:23
L31	10	((("4158720") or ("4130500") or ("4002492") or ("3957532") or ("4980250") or ("4945014") or ("4959281") or ("5569520") or ("5455126") or ("4730383"))).PN.	USPAT; USOCR	OR	OFF	2005/06/14 14:23
L32	52	((battery or batteries or ((electrolyte or electrochemical) adj cell) or (energy adj storage adj (device or unit)) or (energy adj device)) and (thin adj film adj layer\$2)) and (lithium near3 alloy)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:23
L33	7	"660807".ap.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:23

L34	123	(anode same (thin adj film)) same (lithium near3 alloy)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:23
L35	146	(((layer\$3 or strata or lamina or lamella\$2 or lamina\$3 or laminose or stratif\$4 ) same (anode same (thin adj film))) and (lithium near3 alloy)) and (battery or batteries or ((electrolyte or electrochemical) adj cell) or (energy adj storage adj (device or unit)) or (energy adj device))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:23
L36	162	(((mg or magnesium) or (boron or B) or (Al or aluminum) or (ga or gallium) or in or indium or si or silicon or ge or germanium or sn or tin or pb or lead or sb or antimony or bi or bismuth or cd or cadmium or ag or silver or zn or zinc or hf or hafnium or zr or zirconium or y or yttrium) same (anode same (thin adj film))) and (non adj aqueous)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:23
L37	110	(((layer\$3 or strata or lamina or lamella\$2 or lamina\$3 or laminose or stratif\$4 ) same ((anode or (negative adj electrode)) same (thin adj film))) and (lithium near3 alloy)) and (battery or batteries or ((electrolyte or electrochemical) adj cell) or (energy adj storage adj (device or unit)) or (energy adj device))) not (((layer\$3 or strata or lamina or lamella\$2 or lamina\$3 or laminose or stratif\$4 ) same (anode same (thin adj film))) and (lithium near3 alloy)) and (battery or batteries or ((electrolyte or electrochemical) adj cell) or (energy adj storage adj (device or unit)) or (energy adj device)))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:23
L38	429	((layer\$3 or strata or lamina or lamella\$2 or lamina\$3 or laminose or stratif\$4 ) same (anode same (thin adj film))) and (lithium near3 alloy)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:23

L39	698	(polyester or (cellulose adj1 triacetate) or mylar or poly\$1carbonate or ((S or sulfur) adj resin) or ((n or nitrogen) adj resin)) same ((electrode or anode) adj (support or plate or collector or substrate))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:23
L40	510	polyester same ((electrode or anode) adj (support or plate or collector or substrate))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:23
L41	268	poly\$1carbonate same ((electrode or anode) adj (support or plate or collector or substrate))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:23
L42	3	((((S or sulfur) adj resin) or ((n or nitrogen) adj resin)) same ((electrode or anode) adj (support or plate or collector or substrate))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:23
L43	8	(cellulose adj1 triacetate) same ((electrode or anode) adj (support or plate or collector or substrate))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:23
L44	54	mylar same ((electrode or anode) adj (support or plate or collector or substrate))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:23
L45	41	L40 and "429"/\$.ccls.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:23
L47	154	((((sulfide or sulphide) with (polymer or resin)) or ((imide or amide) with (resin or polymer))) same ((electrode or anode) adj (support or plate or collector or substrate))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:23
L48	1281	L2 same (binder or (binding adj2 agent))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:29

L49	509	L48 same (carbon or carbonaceous or graphite)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/06/14 14:29
L50	8	(("6623888") or ("6506519") or ("6440609") or ("6806003") or ("6679925") or ("6884543") or ("6716557") or ("6677080")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2005/06/14 14:55

[polymerweb.com](http://polymerweb.com)[plasticsusa.com](http://plasticsusa.com)

### Specific gravity of major polymers

Epoxy (Low Density)	.75 - 1.00
Methylpentene Polymer (TPX)	.83 -
Polypropylene Copolymer	.89 - .905
Polypropylene Impact	.90 - .91
Polypropylene Unmodified	.902 - .906
Polyethylene (Low Density)	.91 - .925
Ethylene Vinyl Acetate Copolymer	.925 - .95
Polyethylene (Medium Density)	.925 - .940
Ethylene Ethyl Acrylate Copolymer	.93 -
Ionomers	.93 - .96
Styrene Butadiene Thermoplastic	.93 - 1.10
Polyethylene High Molecular Weight	.94 -
Polyethylene (High Density)	.941 - .965
Polyethylene Cross Linkable	.95 - 1.4, 5
Polypropylene (inert Filler)	1.00 - 1.30
Nylon 12 (Unfilled)	1.01 - 1.02
ABS (High Impact)	1.01 - 1.04
Nylon 11 (Unfilled)	1.04 - 1.05
ABS (Medium Impact)	1.04 - 1.07
Polystyrene (General Purpose)	1.04 - 1.09
Polystyrene (Medium & High Impact)	1.04 - 1.10
Polystyrene Heat & Chemical	1.04 - 1.10
PVC Flexib (Unfilled)	1.05 -
ABS High (Heat Resistant)	1.05 - 1.08
Polypropylene (Glass filler)	1.05 - 1.24
Nylon 6/12	1.06 - 1.08
Polyphenylene Oxides Modified (Noryl)	1.06 - 1.10
Polyphenylene Oxide (PPO)	1.06 -
Styrene Acrylonitrile Copolymer (Unfilled) (SAN)	1.075 - 1.10
Nylon 6/10 (Unfilled)	1.09 -
Acrylics Multipolymer	1.09 - 1.14
Ethyl Cellulose	1.09 - 1.17
Polycarbonate (ABS Polycarbonate Alloy)	1.10 - 1.20
Acrylic Impact	1.11 - 1.18
Urethane Elastomers	1.11 - 1.25
Nylon 6 (Unfilled)	1.12 - 1.14
Nylon 6/6 (Unfilled)	1.13 - 1.15
ABS Self Extinguishing	1.15 - 1.21
Cellulose Acetate Butyrate	1.15 - 1.22
PVC Flexible (Unfilled)	1.16 - 1.30
Acrylics	1.17 - 1.20
Cellulose Propionate	1.17 - 1.24
Phenoxy	1.18 -
Rubber (Hard)	1.20 -
Polycarbonate (Unfilled)	1.20 -
Polystyrene (20-30% Glass filler)	1.25 - 1.33
Styrene Acrylonitrile Copolymer	



(20-33% Glass filler)	1.20 - 1.46	
Polyphenylene Oxides Modified		
(Noryl) (20-30% Glass filler)	1.21-1.36	
Cellulose Acetate	1.22-1.34	
Nylon 12 (Glass filler)	1.23-	
ABS (2040% Glass filler)	1.23 -1.36	
Polysulfone	1.24 -	
Polycarbonate (10-40% Glass filler)	1.24 -1.52	
Alkyd Polyester Synthetic Fiber	1.24 -2.10	
Polycarbonate (Less than 10% Glass filler)	1.25	
Nylon 11 (Glass filler)	1.26	
Polypropylene Modified Vinyl Chloride	1.28 - 1.58	
PVC Flexible (Filled)	1.30 - 1.70	
Polyterephthalete 6PRO	1.31	
Celanese CDY-246	1.32 -	
Nylon 6/12 (Glass filler)	1.32 -1.46	
Phenolic Woodflour & Cotton	1.34 - 1.45	
PVC (Rigid)	1.35 - 1.45	
Polyester Preformed Chopped Roving	1.35 - 2.30	
Casein	1.35	
Phenolic Macerated Fabric & Cord.	1.36 - 1.43	
Nylon 6 (20-40% Glass filler)	1.37 - 1.46	
Polyesters (Thermoplastic)	1.37 - 1.38	
Chlorinated Polyether	1.40 -	
Acetal Copolymer	1.41	
Acetal Homopolymer	1.42 -	
Polyimides Aromatic	1.43 -	
Melamine Cellulose	1.45 - 1.52	
Phenolic (Asbestos Filler)	1.45 - 2.00	
Melamine Alphacellulose	1.47 - 1.52	
Urea Formaldehyde Alpha Cellulose	1.47 - 1.52	
Melamine---Formaldehyde (No filler)	1.48 -	
Polyester (Thermoplastic 18% Glass filler)	1.48 - 1.50	
Melamine (Fabric filler)	1.50 -	
Melamine Fabric (Phenolic Modified)	1.50 -	
Melamine Phenol	1.50 - 1.70	
Polyester Woven Cloth	1.50 - 2.10	
Celanex 917	1.52 -	
Acetal (20% Glass filler)	1.56 -	
Acrylonitrile Copolymer Asbestos	1.57 - 1.65	
Sillicones (Asbestos filler)	1.60 - 1.90	
Epoxy (Glass fiber filler)	1.60 - 2.00	
Epoxy (Mineral filler)	1.60 - 2.00	
Alkyd Granular end Putty (Mineral filler)	1.60 - 2.30	
Acetal Copolymer (25% Glass filler)	1.61	
Polyester Premix (Chopped Glass filler)	1.65 - 2.30	
Silicones (Glass filler)	1.68 - 2.00	
Phenolic (Glass filler)	1.69 - 1.95	

ALL DATA SUBJECT TO GRAVITY

[polymerweb.com](http://polymerweb.com)[plasticsusa.com](http://plasticsusa.com)

### Specific gravity of major polymers

**SPECIFIC GRAVITY**- The ratio of the weight of the molded piece as compared to the weight of an equal volume of water ASTM D792.

Polybutylene	0.60
Polymethylpentene	0.83
Ethylene-propylene	0.86
Polypropylene	0.90-0.92
Polyethylene	
LDPE	0.91-0.93
LLDPE	0.91-0.94
HDPE	0.96-0.97
Polybutene	0.91-0.92
Natural rubber	0.91
Butyl rubber	0.92
Styrene-butadiene	0.93
Polyamide	
PA-12	1.02
PA-11	1.04
PA-6	1.12-1.13
PA-66	1.13-1.15
ABS	1.04-1.07
Polystyrene	1.05
Polyacronitrile	1.17
Polyvinyl acetate	1.19
Polycarbonate	1.2
Polychloroprene rubber	1.23
Polysulphone	1.24
Polyethylene terephthalate	1.34-1.39
PVC	1.37-1.39
POM	1.41-1.43
Polytetrafluorethylene	2.27

### MORE ON SPECIFIC GRAVITY